

## Module 7. The Plan Review Process

### Module 7 Objectives

- After completing this module, you will be able to:
- Understand the plan review process
- Gain increased plan review skills
- Better comprehend the different erosion and sediment control plan components
- Utilize the DEQ plan review checklist

### Module 7 Content

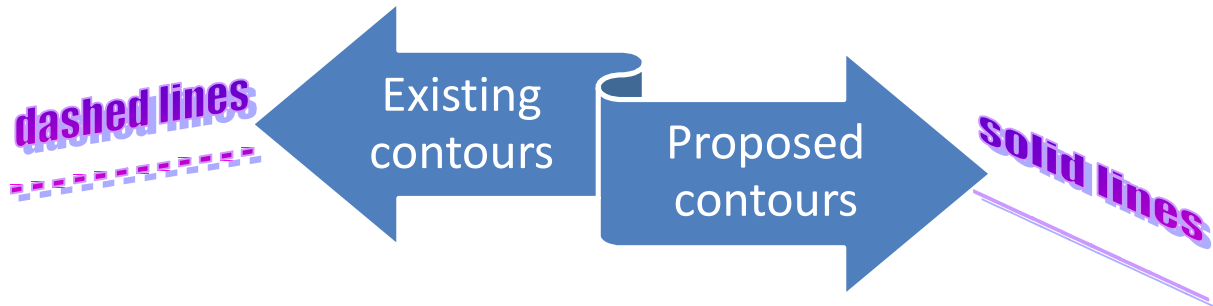
7a. Basic Plan Review Skills

7b. The Erosion and Sediment Control Plan

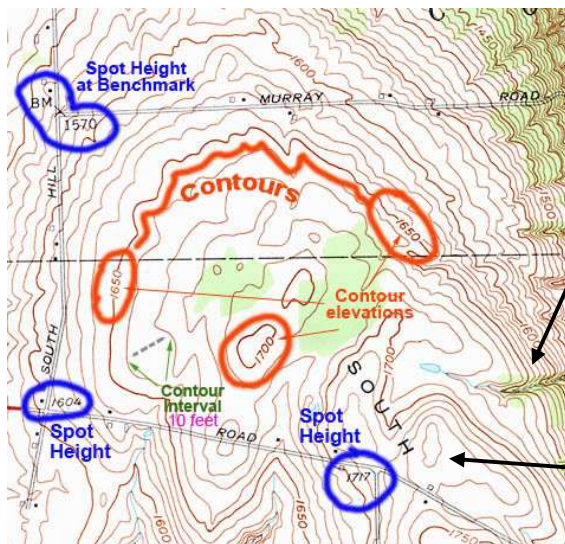
7c. The Plan Review Process and Checklist



**Contour line:** a line on a map connecting points on a land surface that are the same elevation above sea level.



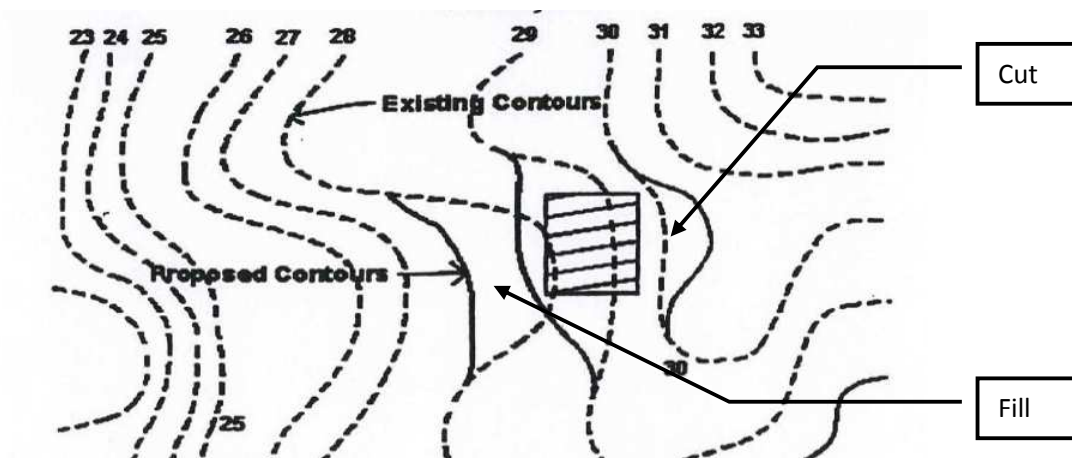
**Contour interval:** the interval between contour lines on a map, or the altitude the interval represents

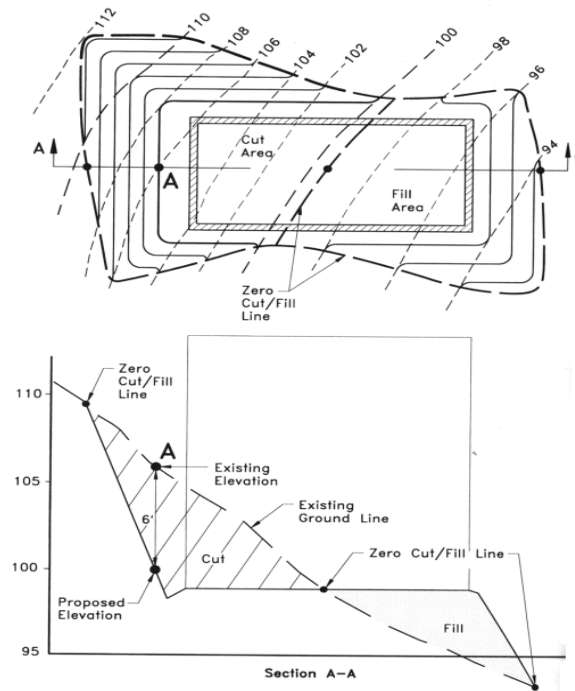


Contour lines close together (small contour interval) = steep slope

Contour lines further apart (large contour interval) = not as steep

**Cut and fill:** the excavating of material in one place and the depositing of it nearby

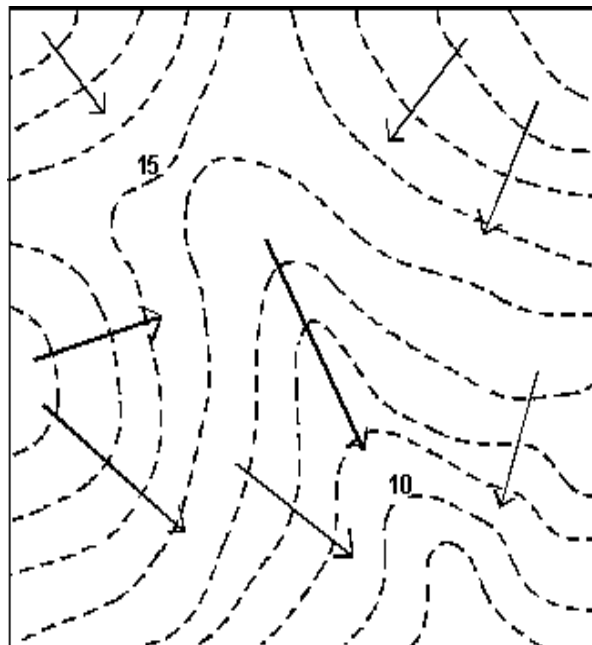




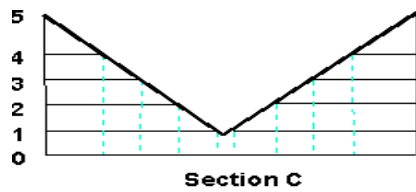
**Cut and fill**

**Drainage:**

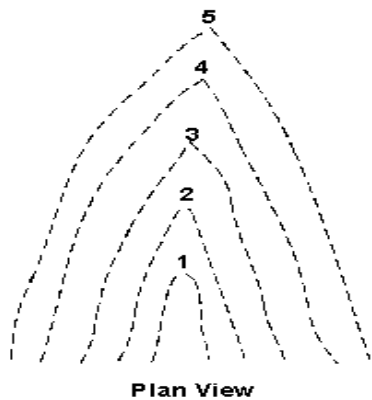
always flows perpendicular (at a right angle) to the contour



**Valleys and Swales:** a long low area of land, often with a drainage way, river or stream running through it, which is surrounded by higher ground

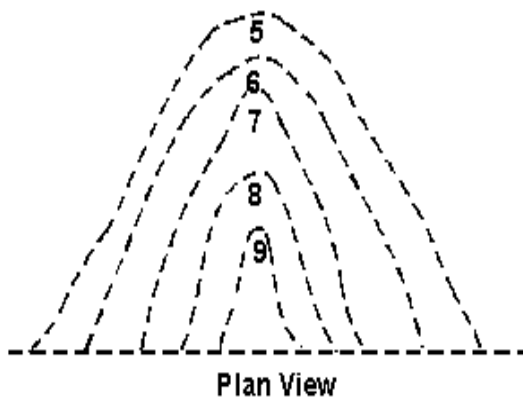
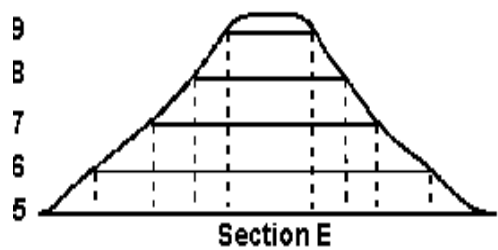


Stormwater runoff and therefore sediment leaves our site through drainage ways in swales or valleys



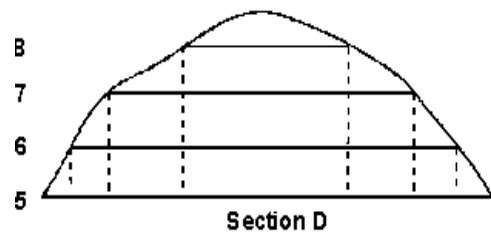
A valley or a swale is represented by contours that point towards the higher numbers.

**Ridge:** a long narrow hilltop or range of hills

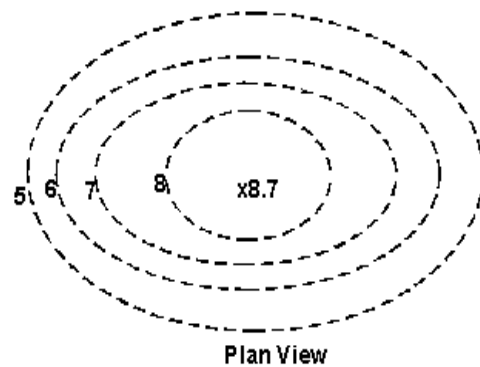


A ridge is represented by contours that point towards the lower numbers.

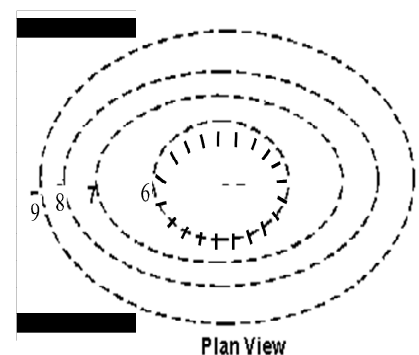
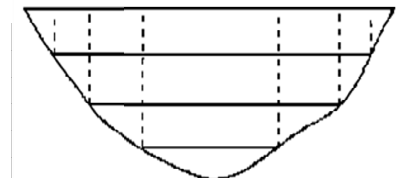
**Summit:** the highest point or top of something, especially a mountain

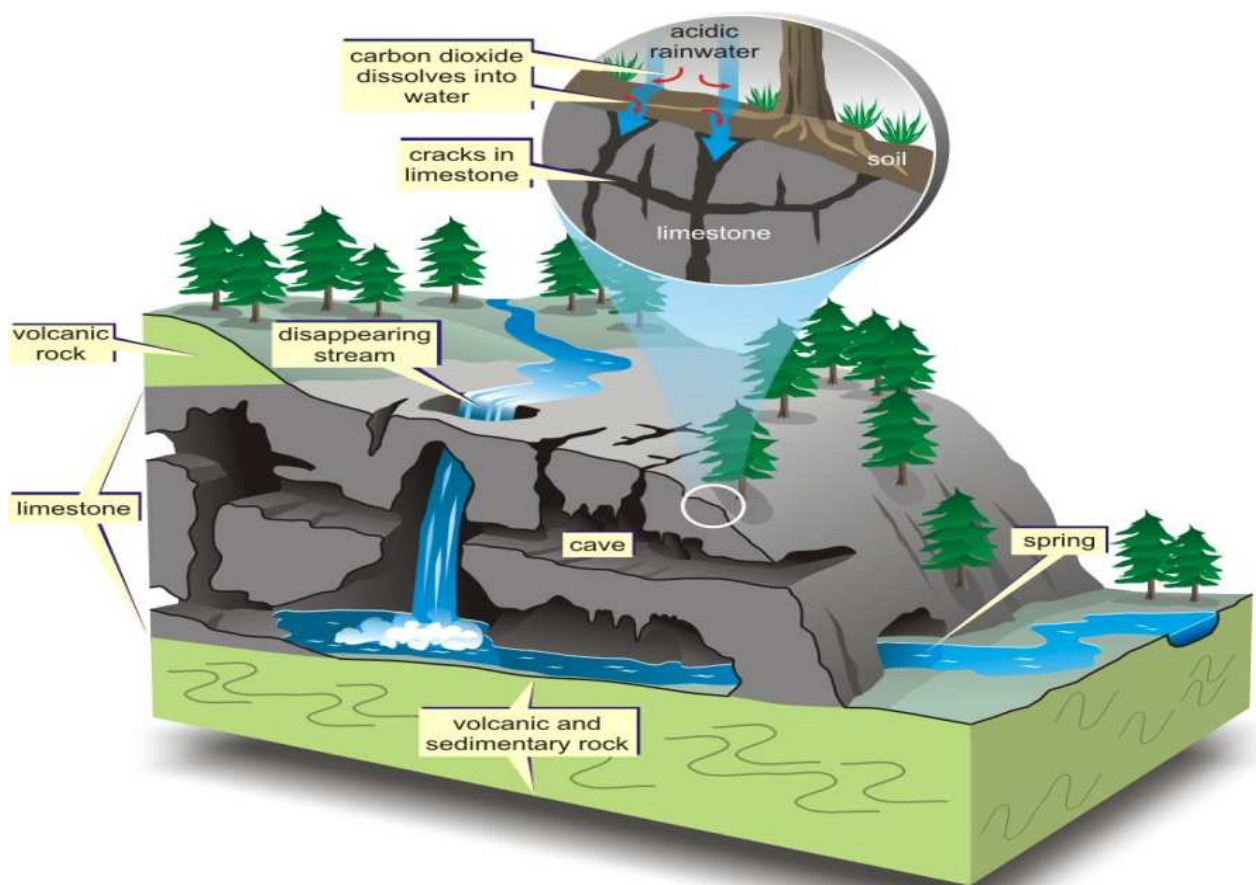
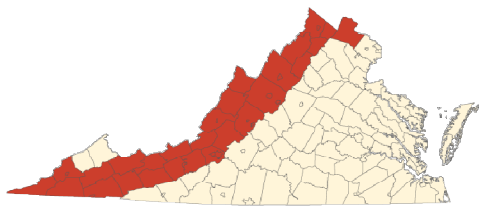


Summits usually have a spot elevation for the highest point; depressions may not have a spot elevation



**Depression/Sinkhole:** a low area in a landscape without a clear drainage way, sinkholes may drain through an underground system (karst system)

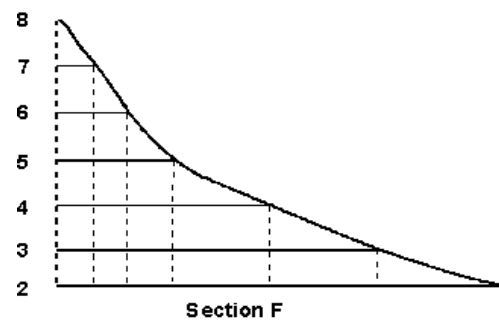




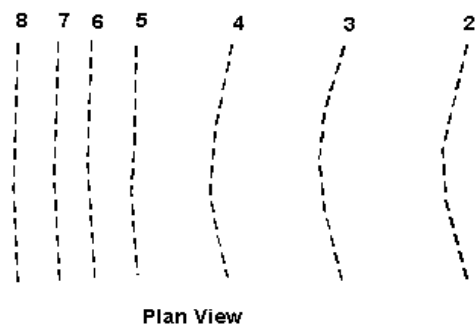
**Karst system**

**Concave slope:**

A slope that is steeper near the top and less steep at the bottom

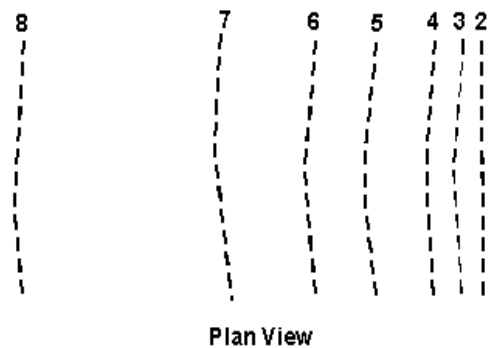
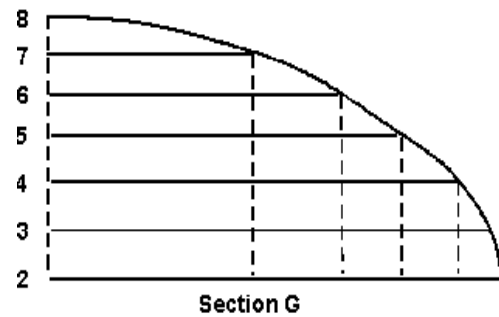


Concave slopes are less erodible than convex slopes



**Convex slope:**

A slope that is steeper near the bottom and less steep near the top



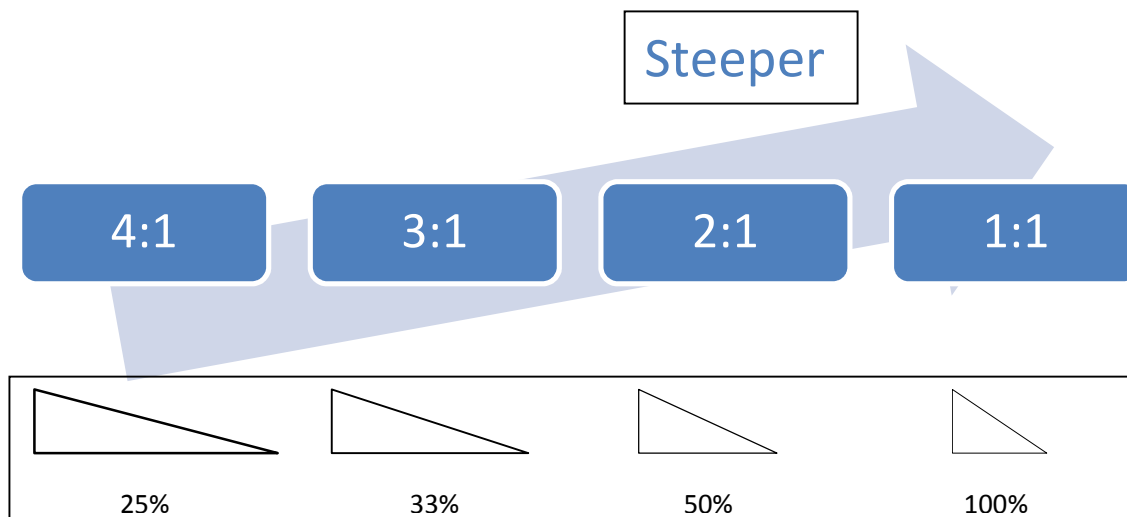


## Slopes and slope calculations

Slope angle is often described as a ratio (2:1, 3:1, 4:1, etc.) or as percent (%) slope. The closer the first number is to 1, or the higher the percentage is, the steeper the slope.

A 3:1 slope indicates for every 3 feet horizontal the slope has 1 foot of vertical rise, while a 5:1 slope means 5 feet horizontal for every 1 foot rise. Thus, a 3:1 slope is more steep than a 5:1 slope. Slope percent is calculated by dividing vertical distance by the horizontal distance in the ratio and multiplying this by 100.

- A 4:1 slope becomes a  $\frac{1}{4} \times 100 = 25\%$  slope.
- A 3:1 slope becomes a  $\frac{1}{3} \times 100 = 33.3\%$  slope.



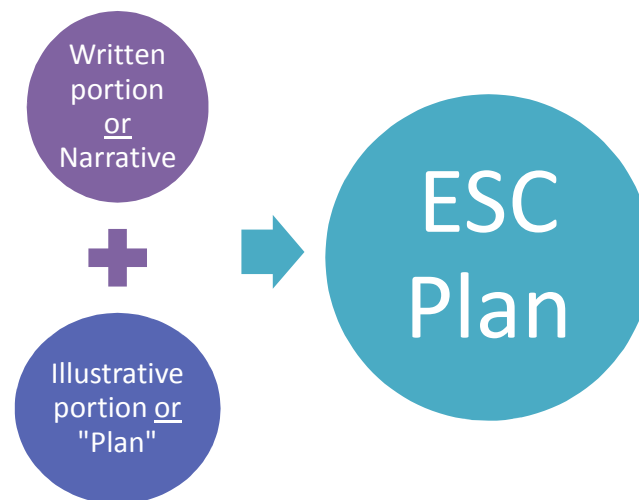
A slope that is 40 feet long and goes from elevation 110 to 125 is a 40:15 or a 2.67:1 slope

Expressed in percent this is a  $\frac{(125-110)}{40} \times 100 = 37.5\%$  slope

## 7b. The Erosion and Sediment Control Plan

### What is an Erosion and Sediment Control Plan?

An erosion and sediment control plan is a document that describes and illustrates the potential for erosion and sedimentation to occur on a construction project. Subsequently the plan describes and illustrates the practices to be taken to control those problems. As mentioned in Module 6, the erosion and sediment control plan consists of two parts: a written portion or the narrative and an illustrative portion or the plan.



An ESC plan should be an independent entity from the working or construction drawings of the project. While it is usually part of the submittal package to the locality and part of the contract documents, the ESC plan itself should contain notes to ensure that the practices are installed, inspected and maintained properly. It should therefore be a stand-alone part of the entire site development plan such as the construction drawings. The ESC plan should show how the site is being developed, what is being proposed for the site, the sequencing and phasing of the construction, without being bogged down with details that might not be relevant to erosion and sediment control. The Plan Reviewer, Inspector and RLD should be able to use the ESC plan to determine how the site is being developed and how to perform their job without the need to consult the more detailed working or construction drawings.

### Who is Responsible for Preparing a Plan?

The owner or lessee of the land being developed has the responsibility for plan preparation and submission. In the case of state projects the owner is the responsible agency. The owner may delegate the responsibility to an engineer, architect contractor, etc., but remains ultimately responsible.

## The Narrative.

The narrative is a written statement that explains the erosion and sediment control decisions made for a particular project and the justification for those decisions. The narrative is especially important to the plan approving authority because it contains concise information concerning existing site conditions, construction schedules, and other pertinent items which are not apparent on a typical site plan. Since a plan reviewer cannot always visit the site or discuss the project at length with the site planner, it is essential that the necessary information be provided for plan review.

While site photographs and public mapping sites that use aerial or satellite photographs (such as Google Maps and Microsoft Maps) and GIS information are invaluable tools in reviewing a site plan, an actual site visit by the plan reviewer is highly recommended.

The narrative is also important to the construction superintendent (RLD) and the inspector who are responsible for seeing that the plan is implemented properly. It provides them with a single report that describes where and when the various ESC practices should be installed.

Narratives can either be stand-alone documents or be printed on one of the plan sheets (see below). The narrative is generally divided in the following sections, specific to the project:

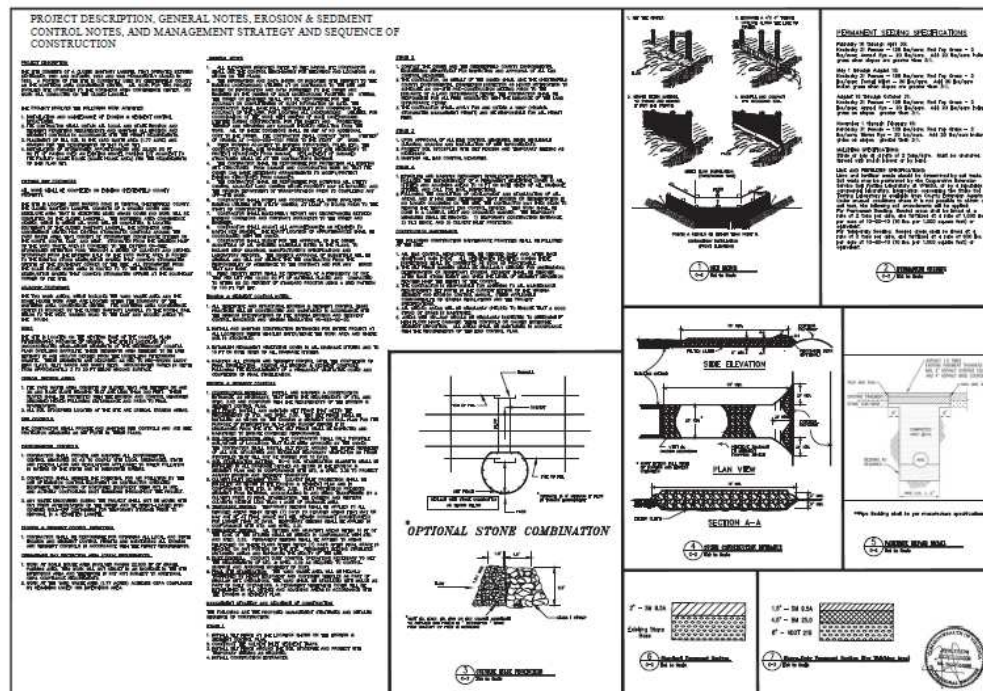
- Project Description
- Existing site Conditions
- Adjacent Properties
- Off-site Areas
- Soils
- Critical Areas
- Erosion and Sediment Control Measures
- Permanent Stabilization
- Stormwater Runoff Considerations
- Calculations
- Maintenance

For example, the narrative below has the following sections:

- Project Description
- Existing site Conditions
- Adjacent Properties
- Soils
- Critical Areas
- Site Controls
- Environmental Controls
- Erosion and Sediment Control Permitting
- Chesapeake Bay Protection Area (CBPA) Requirements

### 7b. The Erosion and Sediment Control Plan

- General Notes
- Erosion and Sediment Control Notes
- Erosion & Sediment Controls
- Management Strategies and Sequence of Construction
- Construction Maintenance



In this erosion and sediment control plan, the narrative is included on the (illustrative) plan.

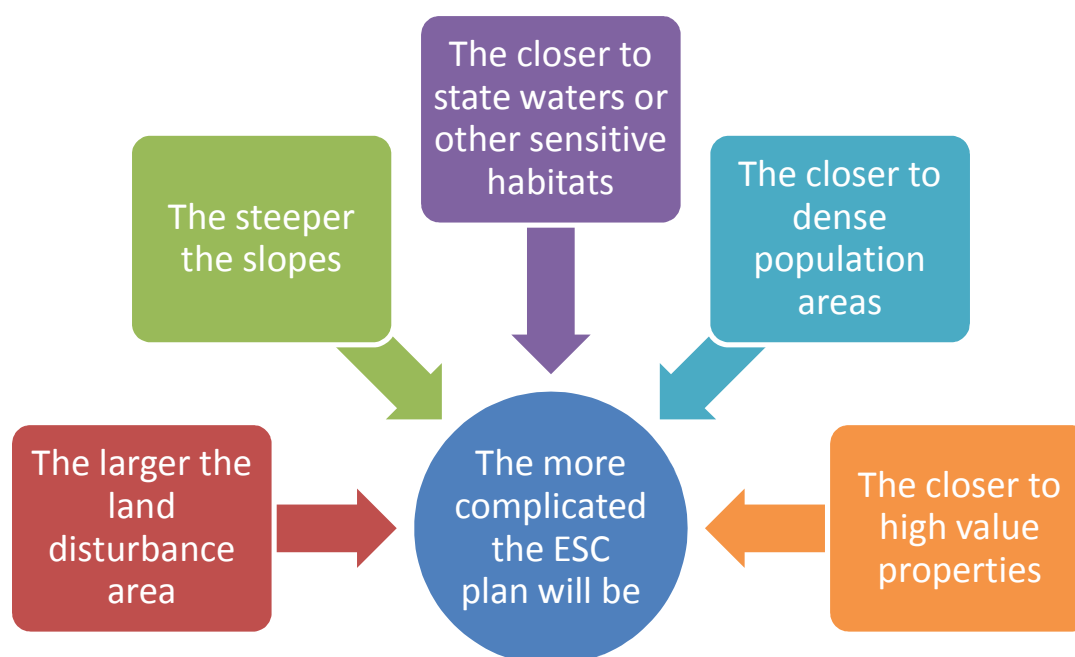
## The Plan

The Plan or the illustrative portion of the ESC plan consists of a number of maps or plats. These usually include (1) a cover sheet which generally has a small vicinity map that shows the general location of the project; (2) a soils map; (3) a map showing the drainage areas and general drainage directions on the site; (4) a site map showing the original conditions; (5) a plat showing the proposed development including the ESC plans; (6) a sheet with details on the ESC measures; and in some cases (7) a sheet that includes the narrative. Some of these sheets may be omitted or combined, depending on the complexity of the project.

## 7c. The Plan Review Process and Checklist

### What is an “Adequate” Plan?

A plan must contain enough information to satisfy the plan approving authority that the problems of erosion and sediment control have been adequately addressed.



An adequate plan will meet the following criteria:

- The requirements of the Virginia Erosion and Sediment Control Regulations in particular the minimum standards, unless a variance has been applied for and has been granted;
- Any more stringent standards applicable to the locality;
- The standards and specifications published in the Erosion and Sediment Control Handbook (ESCH)(Chapter 3); and
- It contains sufficient information to ensure the plan approving authority potential problems of erosion and sedimentation have been adequately addressed.

**Note:** new, innovative and/or proprietary practices may also be used; however, these practices need to be thoroughly described to the satisfaction of the plan approving authority

Whatever practices are used they need to be titled, numbered and drawn as shown in the ESCH.

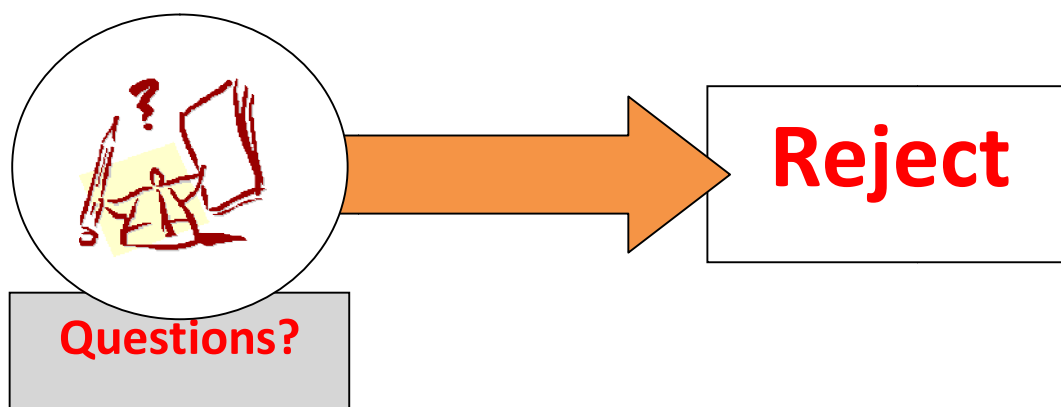
## The Process

Plan review starts with the submittal of a plan to the locality. While all localities will have a different system of plan review, according to §62.1-44.15:55-B the review time should be no longer than 60 days. However, in a subsequent paragraph, the locality is required to notify the plan submitter within 45 days that the plan will not be approved.

The initial step in plan review would be to check if the plan is complete. The law does not provide extra time for this and this should be accomplished within the 45 days.

Once it is found that the plan is complete the plan review can commence in earnest. Review time depends on the complexity of the program, as was illustrated on the previous page. Hopefully, plan review will include a field visit, although this is not a requirement. The locality should have a plan review checklist that would assist them plan reviewer in the review. The generic DEQ plan review checklist is included in the appendix for this course and discussed below.

Plans should be clear and should not leave room for interpretation. The reviewer should not be required to guess what the plan preparer meant, or was seen in the field. Any guess work during plan review would also lead to guessing in the field by the site supervisor or inspector.



As was discussed in Module 4, there will be certain situations where a minimum standard cannot be complied with or that a practice cannot be installed the way it is detailed in the standards and specifications of the ESCH. The project proponent is allowed to request a variance in these cases. Variance request must be done in writing, and they cannot be done for economic reasons. Review time is 10 days and after the 10 days they are automatically denied when the applicant gets no response from the plan approving authority.

## Request

- At time of plan submittal
- During construction when field conditions/situations changes
- Must be done in writing
- Cannot be done for economic reasons (i.e. too expensive)

## Review

- 10 days
- After 10 days, it is automatically denied
- Review must be judicious

Finally at the time of plan approval and permit issuance, the owner of the project must provide a name and certificate number of an RLD for the project.

Plans may be altered when site conditions change. Changes need to be approved by the plan approving authority.

### The DEQ Plan Review Checklist

The generic DEQ Plan Review Checklist is included in the appendix of this training manual. It consists of three sections:

- Minimum Standards
- Narrative
- Site Plan

When reviewing the plan for compliance with the Minimum Standards, the plan needs to address all applicable Minimum Standards. This is also where the reviewer can determine whether a variance has been applied for and if it is appropriate to grant the variance.

Although flexible the **narrative** is generally divided in the following sections, although this may be project specific:

- Project Description
  - This section should briefly describe the nature and purpose of the land-disturbing activity, and the area (acres) to be disturbed.
- Existing site Conditions
  - This section should provide a description of the existing topography, vegetation and drainage of the site.
- Adjacent Properties
  - This section should provide a description of neighboring areas such as streams, lakes, residential areas, roads, etc., which might be affected by the land disturbance.
- Off-site Areas
  - This section should describe any off-site land-disturbing activities that will occur (including borrow sites, stockpiles, etc.).
- Soils
  - This section should provide a brief description of the soils on the site giving such information as soil name, mapping unit, erodibility, permeability, depth, texture, and soil structure.
- Critical Areas
  - This section should provide a description of areas on the site which have potentially serious problems (steep slopes, channels, wet weather/underground springs, etc.).
- Erosion and Sediment Control Measures
  - This section should provide a description of the methods which will be used to control erosion and sedimentation on the site. Chapter III VESCHB.
- Permanent Stabilization
  - This section should provide a brief description, including specifications, of how the site will be stabilized after construction is completed.
- Stormwater Runoff Considerations
  - This section should address the question if the development site will cause an increase in peak runoff rates; and if the increase in runoff will cause flooding or channel degradation downstream. It should also provide a description of the strategy used to control stormwater runoff.
- Calculations
  - This section should provide detailed calculations for the design of temporary sediment basins, permanent stormwater detention basins, diversions, channels, etc. It should include calculations for pre- and post-development runoff.
- Maintenance
  - A schedule of regular inspections and repair of E&SC structure should be set forth in this section.



Although flexible the **plan** should include the following items, although this may be project specific:

- Vicinity map
  - This is a small map that locates the site in relation to the surrounding area. It should include any landmarks which might assist in locating the site.
- North arrows
  - These would allow the persons developing, reviewing and using the plans to determine slope orientation and general position of the site.
- Limits of clearing and grading
  - This is a first step measure (MS-4), and these limits need to be clearly marked in the field. It also assists with natural area and/or tree protection.
- Existing contours
  - These should be represented in dashed lines and are used to examine pre-development conditions, drainage areas, critical area, to determine cut and fills and eventually the proper use of the proposed ESC measures.
- Final contours
  - This will provide information on changes to the drainage patterns of the site, provide cut and fill information, steep slope information and it would allow us to determine stormwater discharge from the site and channel adequacy.
- Existing vegetation
  - Like the limits of clearing and grading, this will assist us with the preservation of green spaces and tree protection.
- Soils
  - This is to assist the soils section in the narrative.
- Existing drainage patterns
  - This would give us an indication of drainage patterns and drainage areas (in acres) that need to be treated with our ESC measures. It is used to size structural controls.
- Critical erosion areas
  - This is to assist the critical area section in the narrative and would include steep slopes, long slopes, state waters, threatened and endangered species areas, etc.
- Site development
  - The plan should show the ultimate development of the site.
- Location of the practices
  - All proposed ESC practices need to be location on the plans.

The checklists have a checkmark section that needs to be checked of or used for comments. Rejection of a plan should be accompanied by a detailed explanation of what is missing in the narrative or on the plan.

Review time for subsequent submittals is 45 days.